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(54) Title of the Invention: Method of manufacturing a multi-chamber type hollow moulded article

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## SPECIFICATION

## 1. Title of the Invention

Method of manufacturing a multi-chamber type hollow moulded article

## 2. Scope of the Patent Claim

1. Method of manufacturing a multi-chamber type hollow moulded article comprising a plurality of unit hollow moulded articles, which method of manufacturing a multi-chamber type hollow moulded article is characterized in that an appropriate number of unit moulded articles in which through-connection holes have been punched are held in a prescribed concave part of a blow moulded set, comprising a plurality of moulds to be matched, in such a way as to afford the through-connection of the abovementioned through-connection holes with the exterior, a parison is supplied to a prescribed region of the separate abovementioned moulds, the abovementioned moulds are matched and clamped, a pressure gas is blown into the abovementioned parison to afford the expansion thereof and the moulding of another unit hollow moulded article, and the unit hollow moulded articles are integrated.

## 3. Detailed Description of the Invention

Technological Field

The present invention relates to a method of manufacturing a variable shaped hollow article and, more particularly, it relates to a method of manufacturing a hollow moulded article comprising a multi-chamber structure.

Prior Art

The hollow moulded article 1 shown in Figure 1, which constitutes a component part proximal to the cooling part of the pipe of a car air conditioner, comprises a double-layer structure in which a hollow chamber 3 is attached to the periphery of a pipe 2. In cases where the manufactured article 1 such as this is moulded from plastic or the like, initially, the hollow pipe 2 is moulded, and then a hollow chamber 3 moulded in advance is secondarily attached to a prescribed position on the pipe 2. Although an adhesive or the like is often used for this attachment this has a drawback in that the adhesive strength between the hollow chamber 3 and pipe 2 is weak and the hollow chamber 3 detaches easily from the pipe 2. Generally, in order to integrally mould a hollow moulded article comprising a multi-chamber structure like the manufactured article 1 of Figure 1 there is, accompanying the inherent difficulties thereof, an excessive cost requirement.

Objective

The objective of the present invention is, in view of the point noted above, to provide a method of manufacturing a hollow moulded article in which a multi-chamber type hollow moulded article comprising a plurality of hollow regions can be integrally moulded at low cost.

Configuration

A detailed description is given below, with reference to the attached diagrams, of a mode of embodiment of the present invention. The present invention constitutes, in a method of manufacturing a multi-chamber type hollow moulded article comprising a plurality of unit hollow moulded articles, a method of manufacturing a multi-chamber type hollow moulded article characterized in that an appropriate

number of unit moulded articles in which through-connection holes have been punched are held in a prescribed concave part of a blow moulded set, comprising a plurality of moulds to be matched, in such a way as to afford the through-connection of the abovementioned through-connection holes with the exterior, a parison is supplied to a prescribed region of the separate abovementioned moulds, the abovementioned moulds are matched and clamped, a pressure gas is blown into the abovementioned parison to afford the expansion thereof and the moulding of another unit hollow moulded article, and the unit hollow moulded articles are integrated.

As is shown in Figure 2, a raw material substance such as plastic is supplied to a hopper 4 of a device for manufacturing a hollow moulded article. An auger screw 6 is provided with freedom to rotate in a conduit linked to the bottom part of the hopper 4, a heater band 7 is wound around the periphery of the conduit 5, and the other end part of the conduit 5 is linked to an extrusion nozzle 8. For this reason, the raw material substance within the hopper 4 is advanced into the conduit 5, whereupon it is heat-melted by the heater band 7 and is led to the extrusion nozzle 8. As is shown in Figure 3, a cylindrical-shaped parison 9 is injected outward from the extrusion nozzle 8.

Next, as shown in Figure 4, in order to form a first hollow moulded article 10, the parison 9 is housed between a first mould 11, in which a groove 11' conforming to the shape of the first hollow moulded article 10 has been scribed, and a second mould 13 in which a fitted mould 12 has been fit-inserted, wherein the clamping of the first mould 11 and the second mould 13 is performed. A pressure

gas is blown into the parison 9 whereupon the parison 9 expands to be pressure-attached to the first mould 11 and the fitted mould 12 of the second mould 13. Thereafter, when gradual cooling thereof occurs, the first hollow moulded article 10 as shown in Figure 5 is produced. The clamping of the moulds is released to separate the two moulds wherein the fitted mould 12 fit-inserted in the second mould 13 is detached. The first hollow moulded article 10 adhered to the first mould 11 is left in an unaltered state in which it is held in the groove 11'. It will be noted that the first hollow moulded article 10 may be either blow-moulded in advance using a separate mould or it may be housed in a rear groove 11' formed by a desired method of moulding such as injection-moulding. In addition, as a substitute for the above-described fitted mould 12, a pressure-resistant substance or the like can be packed in the second mould 13.

Next, as shown in Figure 6, a hole 15, that does not contact the first mould 11, is punched in a surface 14 of the first hollow moulded article 10. It will be noted that, in the case where the first hollow moulded article 10 is moulded in a separate step as described above, this hole 15 may be punched prior to the housing in the groove 11'.

Next, as shown in Figure 7, the parison 9 is supplied between the first mould 11 in which the first hollow moulded article 10 is housed and the second mould 13, and the respective moulds 11, 13 are moved in the direction of the arrow in Figure 7 and clamping of the moulds is performed.

Next, when a pressure gas is blown into the parison 9, the parison 9 is expanded so as to be pressure-attached to the first mould 11, the second mould 13, and the surface 14

of first hollow moulded article 10 which has a hole 15 punched into it. At this time, as shown in Figure 8, the vicinity of the hole 15 of the surface 14 provided for the expanded parison 9, due to the injection of the pressure gas, expands locally and bursts. At this moment, the pressure gas flows into a cavity A of the first hollow moulded article 10, and the pressure within the cavity A and pressure within a cavity B of the parison 9 is equalized. That is to say, a through-connection between the cavity B and cavity A is formed. For this reason, although the pressure is increased by the injection of the pressure gas, the inner pressure of each of the cavities A and B is balanced and no deformation in the shape of the surface 14 of the first hollow moulded article 10 occurs. In this way, a parison 9 is pressure-attached to the first and second moulds 11, 13 and the first hollow moulded article 10 in which the prescribed shape as shown in Figure 9 is maintained, wherein a second hollow moulded article 16 of a desired shape is moulded. Furthermore, because the parison 9 is pressure-attached to the first hollow moulded article 10, the first hollow moulded article 10 and second hollow moulded article 16 are integrated at the surface 14 of the pressured first hollow moulded article 10. Following this, when the clamping of the moulds is released and the moulded articles are removed from the mould and gradually cooled, a multi-chamber hollow moulded article 1 configured from a plurality of hollow regions such as shown in Figure 1 is produced.

#### Effect

As is described above, according to the method of manufacture of the present invention, the integration of a plurality of unit moulded hollow articles can be performed

easily, whereby a multi-chamber hollow moulded article can be manufactured, by the through-connection of the inner cavities of each of the plurality of unit hollow moulded articles to afford blow moulding and, accordingly, a useful multi-chamber hollow moulded article can be produced at low cost. In addition, because a plurality of unit hollow moulded articles moulded from the same material are integrally moulded using a blow mould the coupling strength, compared to a multi-chamber hollow moulded article of the prior art which is manufactured by the secondary attachment of a plurality of unit hollow moulded articles, is high and, accordingly, undesirable occurrences such as detachment of the unit hollow moulded articles does not occur.

#### 4. Brief Description of the Diagrams

Figure 1 is a type diagram of a multi-chamber hollow moulded article configured from a plurality of hollow regions; Figure 2 is a type diagram of a device for manufacturing hollow moulded articles; Figure 3 is a cross-sectional view of an extrusion nozzle; and Figures 4 to 9 provide an explanatory view for explaining the steps of the method of manufacture of the present invention.

#### (Description of Symbols)

8: Extrusion nozzle,	9: Parison
10: First hollow moulded article	11: First mould
13: Second mould	15: Hole
16: Second hollow moulded article	

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9

Fig. 1

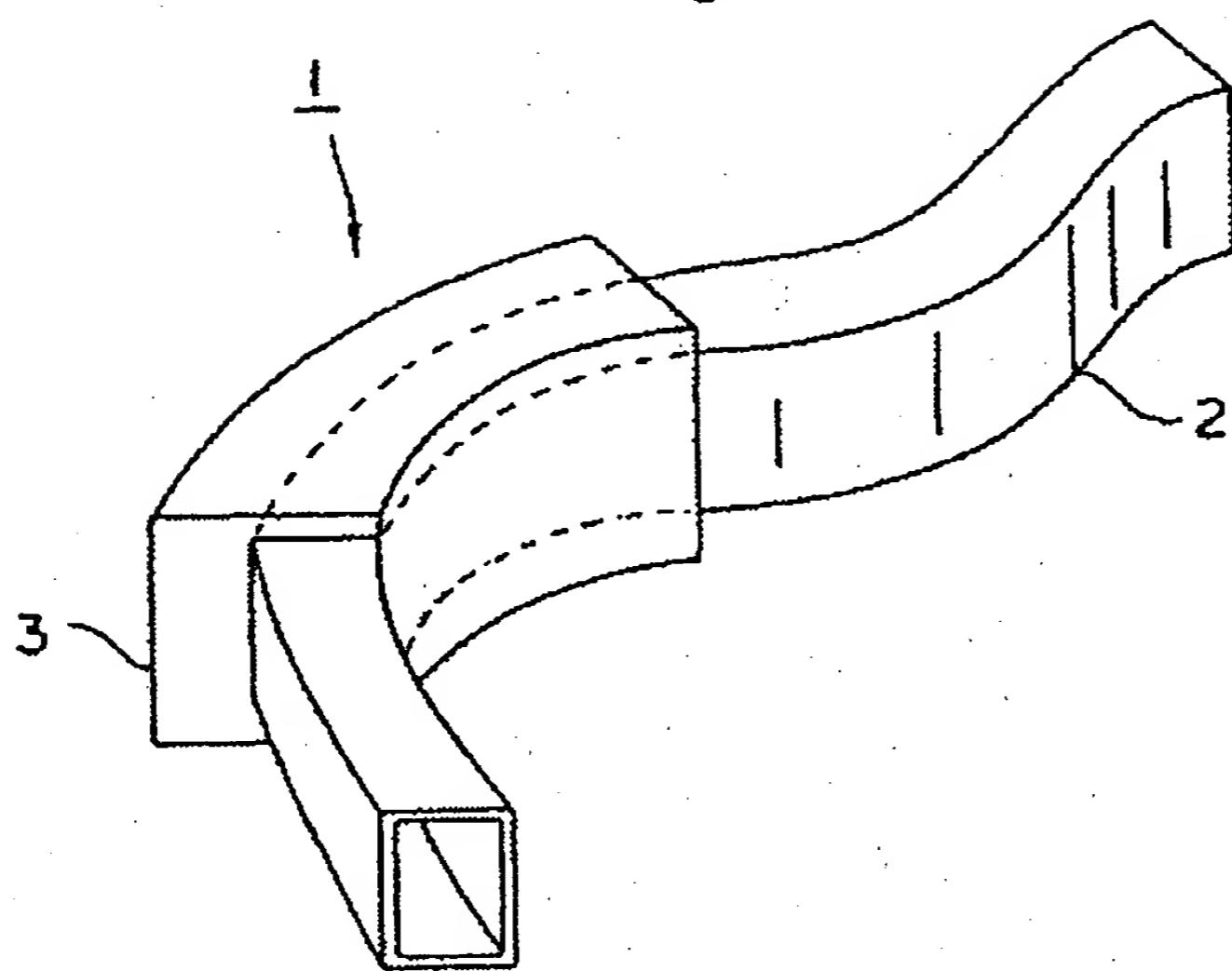
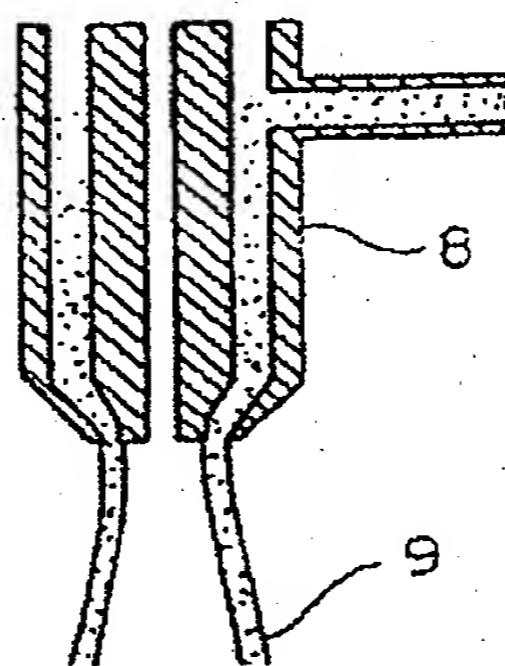


Fig. 3



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Fig. 2

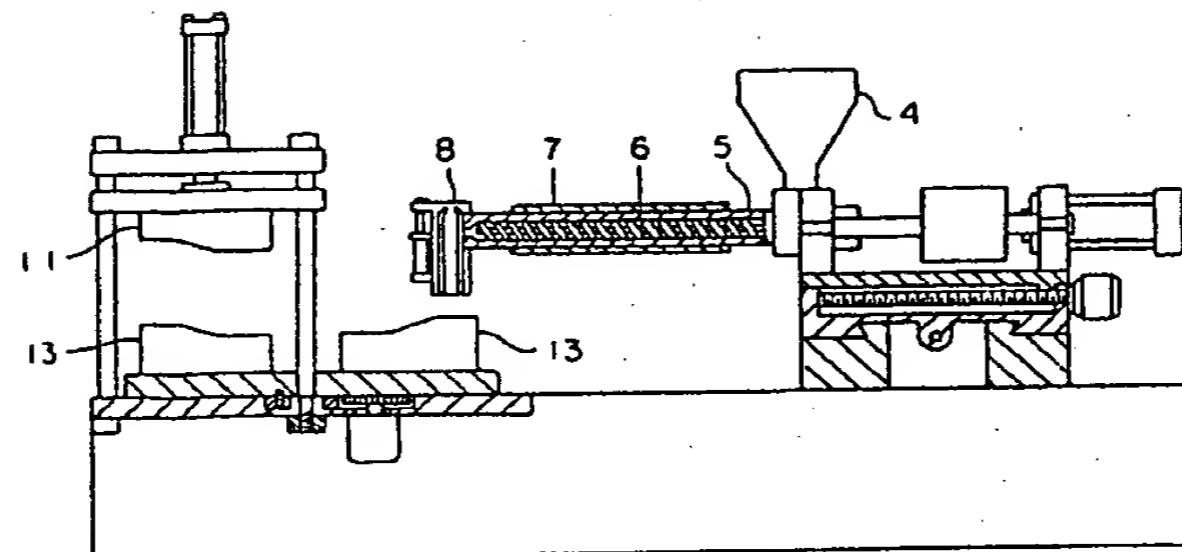


Fig. 4

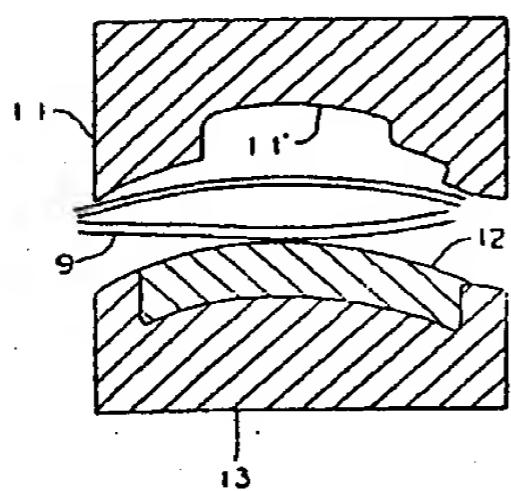


Fig. 5

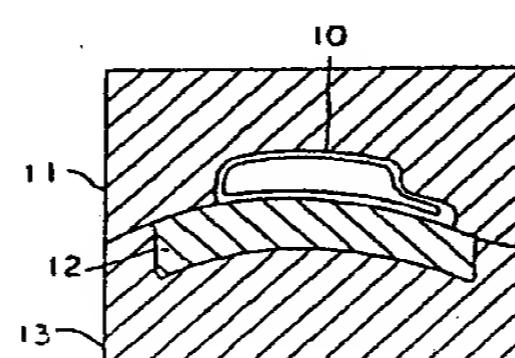


Fig. 8

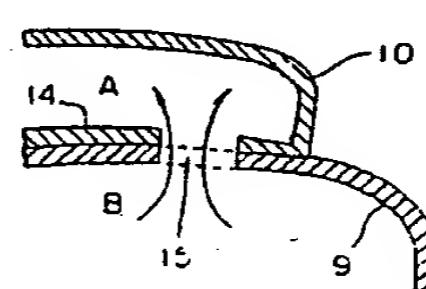


Fig. 6

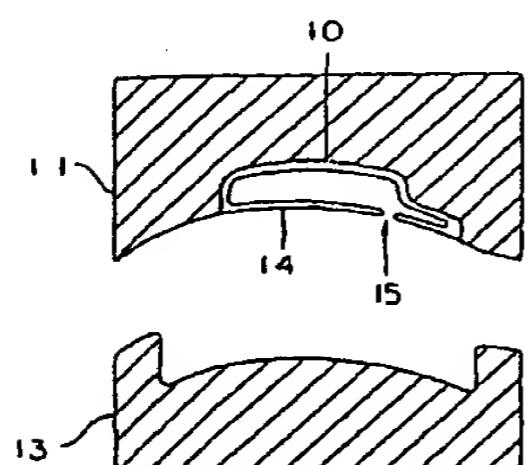


Fig. 7

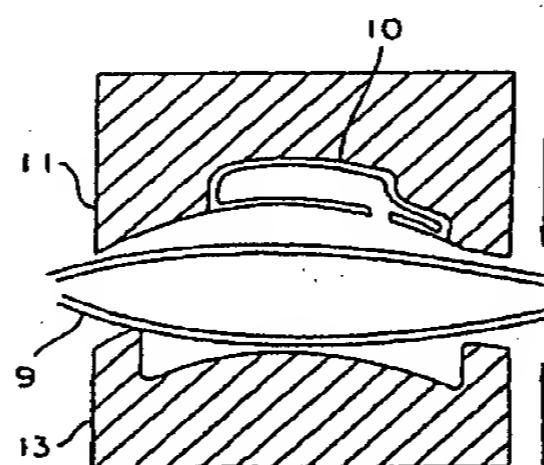


Fig. 9

